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ABSTRACT

The author proposes that dissimilation, like assimilation, be considered a natural linguistic process, motivated by perceptual (psychological factors, which operates to preserve the distinctiveness of the stem-affix relationship. Defining dissimilation as the process which occurs when twosegments in the same word share the same phonetic features and one of the segments, usually the second of the pair, causes the other to either change one or more of its phonetic features or to be deleted, the author cites several examples of phonetic and morphophonemic dissimilation. In the examples presented, dissimilation is considered a perceptual universal with the function of enhancing the prominence of concatenated morphemes. (VM)

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DISSIMILATION AS A NATURAL PROCESS IN PHONOLOGY

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1. Background.

At least since the late nineteenth century, there has existed in European linguistics a tradition of considering dissimilation as a general process in language (Grammont 1895, Meillet 1936, Trubetzkoy 1939, Posner 1961, Sommerfelt 1962).[1] In the writings of American scholars, however, assimilation is regarded as a widespread, general and "natural" process, while dissimilation is seen as restricted or unnatural. Linguistics textbooks have either treated dissimilation as a minor source of language change, along with haplology and metathesis (Whitney 1867, Hockett 1958, Gleason 1961:85, Bolinger 1968:94, Arlotto 1972:87), or they have ignored it (Hoenigswald 1960, Langacker 1968, King 1969). When the process is discussed, it is illustrated briefly with the l/r alternation in Latin (*peregrinus* > *pelegrinus*), or with Grassmann's Law, operating in Sanskrit and Greek (Bloomfield 1933:349, 390, Lehmann 1973:85, 167). Similarly, American linguistics journals contain numerous papers on assimilation (Schachter 1969, Vennemann 1972 are typical in

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[1] I am grateful to Larry Hyman for valuable suggestions on an earlier version of this paper.

this respect), but few on dissimilation. King expresses the general view, stating, "It may well turn out that most phonological change at bottom results from assimilation." (1969:190)

Schane has recently proposed that assimilation is a natural rule in phonology. He questions, however, the possibility of considering dissimilation, as represented by Grassmann's Law, as a natural rule. Noting that many examples of dissimilative changes are sporadic, or operate in particular morphemes, he still wonders about what to do with the apparently phonetically regular Grassmann's Law. He concludes by saying, "Actually, one can say very little about how dissimilation is to be handled until there are more solid examples of this phenomenon" (Schane 1972:216).

What I should like to do here is to consider examples of phonetic and morphophonemic dissimilation. After providing "solid examples of this phenomenon," I will propose that dissimilation is natural and thus should be handled in phonological theory.

First I should like to define dissimilation and naturalness, and show the relationship of dissimilation to assimilation, which many linguists claim is a natural process. Then I should like to point out how dissimilation has a different motivation from assimilation, giving representative examples to support my claim.

2. Definition.

Dissimilation occurs when in the same word two segments

share the same phonetic features, and one of the segments, usually the second of the pair, causes the other to either change one or more of its phonetic features (e.g., voice, continuancy) or to be deleted. The above-mentioned writings by European linguists have also pointed out the effect of contiguous consonants upon each other (called differentiation by Meillet). These examples, however, can be explained from another viewpoint, namely "weakening" (Foley 1972). That is, stops are weakened to continuants intervocalically (ME fadar > ENE father). In a series of two consonants, the first of the pair is in a weaker position, undergoing change (Latin dictus > Ital. detto, not *dekko). Thus, apparent cases of dissimilation are more clearly seen as weakening (Ancient Greek epta > efta). I will not focus, then, on such examples, but rather will be concerned here primarily with non-contiguous segments.

Naturalness is usually defined on the basis of frequency of occurrence in language. Diachronically, natural rules or processes are those which have been frequently observed cross-linguistically by historical linguists. Synchronically, similar types of P-rules or processes are argued to be natural. It has also been claimed (Schane 1972:199) that linguists have an intuitive notion of naturalness. Thus, assimilation is natural both diachronically and synchronically, and its frequency has many times been explained in the

articulatory phonetic sense of "ease of articulation," with a more explicit explanation coming from experimental phonetics as "due to the co-ordination of different tongue muscles (Schane 1973:119).

Traugott states that linguistic changes usually involve either simplification or elaboration, and that a balance of these two opposing tendencies is significant in that if only simplification occurred, distinctions would be reduced. These distinctions, of course, are necessary to language (Traugott 1972:14). Also, it has been explicitly claimed by Chomsky and Halle (1968:178) that "phonological processes of assimilation and dissimilation" can be characterized with the "alpha variables," the use of which commits one "to the view that assimilation and dissimilation are not merely a matter of fortuitous coincidence of almost identical rules, but are, rather, linguistic universals." The alpha variable is thus often used in this sense (Harms 1968, Shapiro 1972).

Given that naturalness is a function of frequency of occurrence, and that this frequency requires some explanation, there appear to be at least three possible positions one might consider with respect to dissimilation. Thus, either (1) dissimilation—like assimilation—is natural because of articulatory ease, or (2) it is unnatural because it is articulatorily difficult, or (3) it is natural for

some other reason. I should like to argue for this third view.

3. Relationship to Assimilation.

What specifically is the relationship of dissimilation to (admittedly natural) assimilation? Are they, as has been claimed, "opposite" (Arlotto 1972:87) or the "reverse" (Antilla 1972:74) of each other? I would claim that they are not isomorphic opposites.

Consider, for example, the following case. While dental and velar consonants frequently assimilate to the palatality of the high front unrounded vowel, as seen in (1),

(1)

$$\left\{ \begin{matrix} t \\ k \end{matrix} \right\} \longrightarrow \check{c} / i$$

Papago: tia $\longrightarrow$ čia 'hail'

Old English: ik $>$ ič 'I'

Slavic: kito $>$ čito 'what'

the opposite of this assimilation, in (2),

(2)

$$\check{c} \longrightarrow \left\{ \begin{matrix} t \\ k \end{matrix} \right\} / \quad i$$

is not found as a typical rule of dissimilation. That is,

one cannot simply reverse the direction of the arrow in a natural assimilation rule and expect to obtain a natural dissimilation rule. Also, while (3) is frequent, (4) rarely, if ever, occurs.

(3) $V \rightarrow \tilde{V} / _____ nas$

(4) $\tilde{V} \rightarrow V / _____ nas$

Although the effects of dissimilation and assimilation are in a sense opposite, their domains of application are not comparable. Since these two processes are, therefore, not opposites, I would propose that they are motivated by different principles. It has frequently been claimed (Schachter 1969, Vennemann 1971) that assimilation, like other phonological processes, is motivated phonetically. Recently, "conceptual" factors have come to assume importance in phonological descriptions (Vennemann 1971, Kiparsky 1972). Generally, a contrast is drawn between these two motivations, the former allowing articulatory ease (irrespective of grammatical information), the latter preserving grammatical distinctions.

4. Motivation for Dissimilation.

While I will not argue that morphemes need to be kept entirely distinct to prevent mergers (since mergers are common enough in language), I do claim that there is perceptual "value" in the "prominence" of segments within morphemes.

(Following Chomsky and Halle (1968), I shall assume that both phonetic rules and rules requiring morphological information belong properly in the phonological component.)

I agree with Vennemann (1971:22-24) that in discussions of linguistic change one must consider "motivations for change along with the functions of change in grammars as symbolization devices, with two ends, a conceptual and a phonetic one." Thus, there are two different simplificatory tendencies in language, one leading to simplifications in the phonological structure (e.g., assimilation), the other leading to optimization of linguistic symbolization. These tendencies are in conflict generally, as the former reduces distinctions in morphemes and the latter introduces them.

5. Examples.

I should now like to turn to various examples of dissimilation, noting distinct differences between them. It appears from the literature that there are few cases of phonetic (that is, non-morphological) diachronic dissimilation. One is the familiar Grassmann's Law (Langendoen 1966, Anderson 1970), as shown in (5).

(5)

$$\begin{bmatrix} -\text{son} \\ -\text{cont} \end{bmatrix} \longrightarrow [-\text{asp}] \; / _____ \; V \begin{bmatrix} -\text{son} \\ -\text{cont} \\ +\text{asp} \end{bmatrix}$$

I-E		Skt	
*bhendh-	>	bandh-	'bind'
*phepheuga	>	pepheuga	'I have fled'

		Grk	
*thrikhos	>	trikhos	'hair'

There are also examples of phonetic dissimilation outside of Indo-European. According to Dyen (article reprint), a Proto-Austronesian sequence *s-s is dissimilated to t-s, as in (6).

(6)

$$\begin{bmatrix} -\text{son} \\ +\text{ant} \\ +\text{cor} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{cont} \end{bmatrix} \quad / \#____V \quad \begin{bmatrix} -\text{son} \\ +\text{ant} \\ +\text{cor} \\ +\text{cont} \end{bmatrix}$$

(s) (t) (s)

PAN		Ngaju-Dayak	
*sisik	>	tisik	'fish scale'
*susu	>	tuso	'breast'

Iban (Sea-Dayak) also exhibits this dissimilative change.

Iban		PAN
tisil 'cut'	<	*s-s
tusun 'crowd'		

One other example of phonetic dissimilation, called Ganda Law, emphatically stated by Meinhof (1932) as a general

phonetic rule, has been shown by Meeussen (1962) to be restricted in application to voiced labials, velars and liquids in nominals belonging to a fixed class.

There is, however, the clear case of phonetic dissimilation called Dahl's Law, also explicitly stated by Meinhof and confirmed by Guthrie (1948:45), Tucker and Bryan (1957: 48, 55) and Kahler-Meyer (1971). Similar to Grassmann's Law, Dahl's Law states that "when two successive syllables each begin with an aspirate the first of these loses its aspiration and becomes voiced" (Meinhof 1932:181). The law operates in some Benue-Congo languages, such as Nyamwezi, Shambala, and to a lesser degree in Kikuyu, as in (7).

(7) Dahl's Law

$$\begin{bmatrix} -\text{son} \\ -\text{cont} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{voice} \end{bmatrix} \quad / _____ V \quad \begin{bmatrix} -\text{son} \\ -\text{cont} \\ -\text{voice} \end{bmatrix}$$

Proto-Bantu		Nyamwezi	
*-kati	>	-gathi	'in the middle'
*-tatu	>	-dathu	'three'
*-pita	>	-bitha	'pass'

(Note that th is an aspirate from original t, as are ph and kh < p, k, showing that aspiration was the crucial dissimilatory feature, that is, *kati > *khathi > kathi > gathi, thus -asp ⊃ +voice.)

According to Bennett (1957), Dahl's Law also operates in Embu, Mwimbi and Tharaka, though restricted to velar obstruents (for example, Southern Kikuyu gukua 'to deal' < kukua).

These are the only clear examples of truly phonetic diachronic dissimilation that I have found in a vast literature on this topic. Thus, in terms of naturalness, as compared with the great frequency of historical assimilation rules on the phonetic level, these examples must be tentatively judged as infrequent.

From here on, I will be concerned with dissimilation diachronically and synchronically as a natural process in the sense that it is a perceptual universal, that is, a natural rule whose function is to enhance the prominence of concatenated morphemes. As will be seen in the following examples, this entails distinguishing affixes from stems—or in other words, making stem boundaries more prominent.

There are, of course, numerous examples of l/r dissimilation in Latin and the Romance languages. As Posner reports, every conceivable modification of this phenomenon has been observed (1961:105). For example, Latin fragrāre 'fragrant': in Catalan the first r is deleted, while in French it appears as l; in Spanish the second r is deleted. In Latin frigorosum, the second r appears as l in French (frileux 'chilly'). In the Latin present participle fragrāns, both r's are preserved in the English borrowing,

'fragrant.' Though the usual direction of dissimilation is regressive (as is the usual direction of assimilation) (Kent 1936), a number of progressive dissimilations have been cited. (The multiplicity of changes in the l/r alternation is what caused Grammont and others after him to attempt to posit numerous *ad hoc* principles to deal with observed forms.)

Perhaps the answer for the instability of l and r together in a word can best be explained by some non-dissimilative factor, such as "strength" or some (physical) phonetic factor. However, the clearest cases of l/r dissimilation are those in which stems are attached to suffixes, as can be seen in (8).

(8)

$$\begin{bmatrix} +\text{cons} \\ +\text{voc} \end{bmatrix} \longrightarrow \begin{bmatrix} -\prec\text{lat} \end{bmatrix} \quad / \quad \begin{bmatrix} +\text{cons} \\ +\text{voc} \\ \prec\text{lat} \end{bmatrix} \#_____ \begin{bmatrix} +\text{suffix} \end{bmatrix}$$

Latin

lī̆berā̆-lis, mortā̆-lis (stem r and suffix l)

familiā̆-ris, populā̆-ris (stem l and suffix r)

This is still a productive process in English, as pointed out by Ross (reported by Kiparsky 1972:216) where dissimilation operates on the adjective-forming suffix -al $\longrightarrow$ -ar when attached to verbs with an l in the stem ('cellular,' 'circular'), and a constraint on derivational morphology preventing the nominalizing suffix from being

added to verbs containing l ('betrayal,' 'rehearsal,' 'burial,' but not *applial, *allowal). As can be seen in the Latin example, then, the prominence of the different liquid in the suffix, caused by perceptual needs, is the motivating factor for this dissimilation. That is, a form *populalis would lack this distinctiveness and thus the suffixal l would be a poor marker for the suffix. All other cases of l/r dissimilation are truly sporadic, for example, English 'turtle' < L. turtur, 'purple' < L. purpre, but 'brother': L. frāter, 'crater': L. crātēr.

Dissimilation can be found in a number of American Indian languages. All cases I am familiar with, however, are restricted to concatenated morphemes. For example, in Narragansett and closely related Natick, members of the Algonquin family, the nasal in the locative suffix, reconstructed by Bloomfield as Proto-Algonquin *-enki, was deleted when there was a nasal in the stem (Hamp 1970). Thus in (9):

(9)

Proto-Algonquin				Narr
*aθankwa 'star'	>	*anankwa	>	anockqus
		↓		Nat
		ø		anoqqs

(Proto-Algonquin *θ > Narr, Nat, Menomini, Fox n; confirmed by Haas 1967)

Also, in Narragansett, k → t/kV_____# $\left[+\text{loc}\right]$.

Examples from Cowen (1969) are:

Annaquatuket Conanicut Woonsoket

The first example in (9) demonstrates a perceptual strategy, that is, Ø in the suffix "tells" speakers there is a nasal in the stem. Thus the stem is highlighted, as it also is by the final t in the second example.

Gudchinsky and Popovich (1970) have shown dissimilation to be operative in Maxakali, where the second of a sequence of two nasals becomes devoiced—a case of voicing dissimilation. The examples in (10) are:

(10)

kõnnĩn	+	nõʔõm	→	kõnnĩn̥õʔõm
'macaw'		'that'		
kõnnĩn	+	mĩnnĩ	→	kõnnĩn̥m̥̃nnĩ
		'black'		
kõmãn	+	ŋãñ	→	kõmãn̥ãñ
'co-godmother'		'angry'		

Notice here, too, that the devoicing of the initial nasal in the adjective intensifies, via contrast with the final nasal of the noun, and maximizes the adjective. Thus, in rule form as in (11).

(11)

$$\begin{bmatrix} -\text{voc} \\ +\text{nas} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{voice} \end{bmatrix} \quad / \quad \begin{bmatrix} -\text{voc} \\ +\text{nas} \\ +\text{voice} \end{bmatrix} \#____ \begin{bmatrix} +\text{adj} \end{bmatrix}$$

A further example of dissimilation is taken from Tucker and Bryan's (1964) extensive study of Nandi, a Southern Nilotic language. In Nandi (and closely related Kipsigi), each noun has a primary (short) form and a secondary (long) form. The secondary form ends in a suffix containing -t- (or -d-) in the singular and -k- (or -g-) in the plural. Secondary affixes are classified according to long (Class A) and short (Class B).

In certain Class A nouns, especially those with disyllabic stems or a Primary Number suffix, the secondary suffix preserves length only if the preceding vowel is short; if the preceding vowel is long, the secondary suffix is short. Thus, in (12):

(12)

	Primary	Secondary	
Nandi:	kìmít	kìmìt-ɛ̂:k	'fleas'
	tárì:t	tàrì:ty-ɛ̀t	'bird'

Thus the rule for Nandi (and Kipsigi) is (13):

(13)

$$V \longrightarrow \begin{bmatrix} -\alpha\text{long} \end{bmatrix} \; / \; \begin{bmatrix} V \\ \alpha\text{long} \end{bmatrix} \; C \; \underline{\qquad} \; \begin{bmatrix} +\text{suffix} \end{bmatrix}$$

There has been much discussion about "polarization" and dissimilation in African tone languages (Spears 1968, 1971, Leben 1971). For example, Leben argues for a tonal dissimilation rule in the Chadic language Hausa, shown in (14).

(14)

$$\text{Low} \quad \underset{[+\text{long}]}{\text{Low}} \quad \# \longrightarrow \quad \text{Low} \quad \underset{[+\text{long}]}{\text{High}} \quad \#$$

/káràntaà/ [káràntáa] 'reading'

Assuming this is a valid diachronic and synchronic rule in Hausa, it appears to be, like Grassmann's Law, a phonetic rule.

There are, however, cases where what appears to be tonal dissimilation may have a different historical explanation. Hyman and Schuh (1972:30-31) posit an explanation for a case in Fe?Fe?-Bamileke. In Fe?Fe? one finds a raised-low tone before a high tone (or a pause), but a rising tone before a low tone. There appears to be a rule, as in (15):

(15)

raised-low $\longrightarrow$ rising/_____low tone

Yet consider the following derivations in (16):

(16)

a		b		c		
*cɑ̌́k		cɑ̂́k		cɑ̀k		'pot'
*cɑ̌́k	lɑ́	cɑ̂́k	lɑ́	cɑ̀k	lɑ́	'that pot'
*cɑ̌́k	lè	cɑ̂́k	lè	cɑ̌k	lè	'this pot'

(´ = High, ` = Low, ˩ = Raised Low, ˇ = Rising)

In stage a, raised-low nouns are reconstructed with L-H tone. Stage b shows that the low tone is raised to a raised-low tone (before a high tone). In stage c, the high tone is deleted before a pause (as in the citation form 'pot') or before a high tone, as in 'that pot.' Before a low tone, the raised-low tone becomes a rising tone (as in 'this pot'). Rather than a case of dissimilation, Hyman and Schuh argue that the explanation is the loss of the high part of the rise. They suggest that the rule in Mandarin (McCawley 1970) by which L-L becomes R-L may have a similar explanation.

Other cases I have examined (such as Meinhof's (1932) dissimilative "Kuanyama Law," Winter's (1970) dissimilation in reduplicative forms in Washo, Bucca and Lester's (1970) nasal dissimilation in Kitsai, Sommerfelt's (1962) example in Irish) conform to my claim; that is, while phonetic dissimilation is rare, morphophonemic dissimilation occurs frequently. Notice that even Grassmann's Law, when it operates synchronically (Anderson 1970), can also be argued as perceptually motivated. For example, in Sanskrit reduplicated perfects, shown in (17):

(17)

Root		Present	Perfect
phal	'burn'	phalari	paphela
khad	'chew'	khadan	cakhada
dhauk	'approach'	dhaukati	dudhaka

The rule could be formulated as in (18):

(18)

$$\begin{bmatrix} -\text{son} \\ -\text{cont} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{asp} \end{bmatrix} \quad / \quad \underset{\begin{bmatrix} +\text{prefix} \end{bmatrix}}{\underline{\qquad}} \text{V} \quad \begin{bmatrix} -\text{son} \\ -\text{cont} \\ +\text{asp} \end{bmatrix}$$

As opposed to the few phonetic dissimilation rules (examples 7, 8 and 9), rules (12), (15), (17), (18) and (24) must include grammatical information.

As mentioned above, cases of change between contiguous segments within morphemes can be explained by weakening, or as a result of articulatory processes. What appears, then, as a dissimilatory state (Greek ftero < pteron) may not be due to a dissimilatory process. Or it may be argued that when contiguous segments become dissimilar, it is a result of perceptual factors, to preserve distinctions within morphemes. Only when two contiguous segments are separated by a word boundary (as in example 10) does dissimilation, as I have considered it here, occur.

6. Conclusion.

What I hope to have demonstrated, then, is that while assimilation is phonetically motivated, dissimilation is motivated by perceptual (psychological) factors, and is a natural process which operates to preserve the distinctiveness of the stem-affix relationship. The tendency of speakers to highlight this stem-affix relationship should therefore

be integrated into the metatheory, just as the tendency of speakers to phonetically assimilate contiguous segments has been accommodated. Thus, along with assimilation, dissimilation should be viewed as natural in phonological theory.

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